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ABSTRACT

This investigation compares child language obtained with standardized tests and samples of spontaneous speech obtained in natural settings. It was hypothesized that differences would exist between social class and racial groups on the unfamiliar standard tests, but such differences would not be evident on spontaneous speech measures. Also, higher correlations between test and spontaneous scores were expected when subject-examiner similarity was maximized. Subjects were 40 4-year-old preschoolers. They were tested with subscales of the Wechsler Preschool and Primary Scale of Intelligence (WPPSI) and the Illinois Test of Psycholinguistic Ability (ITPA). Spontaneous speech was recorded by inserting a small transmitter and microphone into vests worn by the children. The transmissions were recorded and scored, using Hunt's T-units, a vocabulary range measure, and a count of concepts used in speech. Analysis of results indicate that both hypotheses were partially supported. Discussion focuses on methodological issues which may have contributed to the unclear data. (DP)

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The Influence of Social Class and Race on Language Test Performance and Spontaneous Speech of Preschool Children

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The most persistent theme in the growing literature on the child disadvantaged for reasons of social class or race is that his language is deficient in important ways. These disadvantaged children have been found to have more limited vocabularies (Lesser, Fifer & Clark 1965), poorer phonetic discrimination (Deutsch 1964), less understanding of teacher's speech (Peisach 1965) and recipients of less adequate parent-child communication (Hess & Shipman 1965). These studies are cited only as representative of the large number of studies which taken together have presented such a persuasive view of social class and race differences in language. The consistency of this view and the degree to which it has been accepted now represents what Ginsburg (1972) calls the "conventional wisdom" about the disadvantaged child's language. This "wisdom" has been applied in the implementation of compensatory education programs for these children. The language intervention programs have met with varying degrees of success (Bereiter & Englemann 1966, Blank & Solomon 1968, Schwartz, Deutsch, & Weissmann 1967) and it is clear that much needs to be learned about language acquisition before really effective programs can be devised for young children.

One major problem is that little is known about the actual language of the disadvantaged child. We have results from psychological tests, laboratory research, and incidental observations, but not much information on the language of these children as it spontaneously occurs in natural settings. The need for this research is suggested by such statements as Reissman's (1962, p. 77) that "Deprived children express themselves best in spontaneous, unstructured situations." Riessman and others have argued that there may be a disparity between speech in natural settings and speech in formal, testing settings. There is also some reason to believe that the familiarity or strangeness of the child's social context may have a strong influence on his use of language. It seems likely that all children tend to talk less and to be less verbally responsive in strange settings and that the testing situation is stranger to the culturally disadvantaged child than to his more advantaged counterpart.

There are many problems in obtaining accurate, representative samples of naturally occurring speech and having once obtained samples there is the additional problem of finding or developing measures directly comparable to those used in test obtained speech samples.

Hypotheses

The study was primarily a comparison of child language obtained with standard tests and samples of spontaneous speech obtained in natural settings. It was assumed that there was a discontinuity between the natural and the artificial situations and that advantaged and disadvantaged children would respond differently. Two closely related hypotheses were developed from a reading of the literature on the language culturally disadvantaged children.

1. Advantaged children will have higher scores on test measures of language than disadvantaged children, but there will be no differences between these groups on the spontaneous speech measures.
2. There will be more significant correlations between test measures and spontaneous speech measures of language for the advantaged than the disadvantaged children.

Subjects

Ss were 40 four-year-old Head Start and nursery school children. They were divided into eight subgroups by social class, race, and sex. Groups were equated for age and Wechsler Preschool and Primary Scale (WPPSI) Performance IQ. Lower Class (LC) children were primarily from Head Start and day care centers. Middle Class (MC) children were drawn from nursery schools. Hollingsworth's

criteria were used to make the social class distinction.

The WPPSI Performance Scale was used to control for nonverbal intelligence. While it is recognized that there may not be such a thing as a "nonverbal" test, the WPPSI Performance subscales used, Animal House, Picture Completion, Mazes, and Geometric Design, can be administered with minimal language exchange between E and S. Although intelligence is not often controlled in studies of social class differences in linguistic performance, Templin (1958) long ago suggested that this be done.

Language Tests

The standard test samples of child language ability were gathered with four subscales of the WPPSI and three Illinois Test of Psycholinguistic Ability (ITPA) subscales. These two tests were chosen because they are so commonly used in the assessment of language ability of preschool children. The WPPSI subscales were Vocabulary, Information, Comprehension, and Sentences. The ITPA subscales were Auditory Vocal Association, Vocal Encoding, and Auditory Vocal Automatic. These three seem to be the most language-relevant of the various ITPA subscales (Dale 1972). The last of these was included because it is particularly influenced by non-standard English dialect. The child's understanding of grammar is assessed by requiring him to supply the proper word forms for tense, pluralization, and comparatives. Non-standard English differs particularly from standard English in these forms. It was expected

that the Black children in this sample would be Black dialect speakers and, therefore, would receive lower scores on this test than on other tests used.

The WPPSI Performance subtests were administered first, followed by the Verbal scales and the ITPA. An effort was made to present the tests much as they are usually administered to preschool children. There were 13 female and 3 male examiners with varying degrees of experience. All were white. All had training in test administration and were instructed to present the tests in the standard way. No exceptional rapport-building sessions were used. Examiners scored the tests and these were checked by the project director. Testing was done in rooms available in the various centers. While all offered privacy, they were far from ideal. Thus, the tests were administered under the same kinds of conditions that characterize much of the early childhood research and diagnostic testing.

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Spontaneous Speech

Ss wore attractive vests which contained a small FM transmitter, the Kinematix Imp II, with microphone. Speech was transmitted to an FM receiver and recorded on magnetic tape. Samples of one and one-half hours were gathered for each S in nursery school setting, indoors or on playgrounds. The effective range

of the transmitter was about 200 feet.

Only one child was recorded at a time. However, to minimize the effect of being singled out for observation, 2 or 3 children concurrently wore vests with active or inactive equipment. Each child wore the vest once before recordings were made. The quality of the incoming signal was monitored by an observer.

Recordings were transcribed verbatim by the observers as soon after a taping session as possible. Each recording was transcribed twice with the final transcript being agreed upon by the two transcribers. Accurate transcription of the spontaneous speech of four-year-olds is difficult and time consuming, but with persistence approximately 90% of the child's utterances could be transcribed accurately. The other 10% were omitted. There were no group differences in the amount of nontranscribed material.

Spontaneous Speech Measures

A great many possible language complexity measures exist, with little information about their relative merits. A review of the literature suggested that the best single measure is Hunt's T-unit (Hunt 1965). These are minimal terminable syntactic units with "one main clause with all the subordinate clauses attached to it" (Hunt 1965, p. 20). "The T-unit...is equivalent to a simple or complex sentence, but a compound sentence would be regarded as

composed of two or more T-units" (O'Donnell, Griffin, and Norris 1967). Scores consisted of the number of words in each T-unit. Rules for defining words were adapted from Templin (1957). The T-unit is similar to such other measures as mean sentence length or mean length of utterance. All of the spontaneous speech measures are based on 300 word samples drawn from the transcripts. All but 5 of the Ss, all LC, produced more than 300 words. Scores for these 5 were prorated.

Vocabulary range was measured with the type-token ratio (Johnson 1944). Using the words included in the previous T-unit counts, each new word (type) was counted as was each additional use of the word (token). The score was the ratio of types to tokens.

The third measure was a count of concepts used by the children in their ordinary speech. The concepts used in the Boehm Test of Basic Concepts (Boehm 1971) formed the basic list. Whenever a child used a concept such as "away from", "inside", "over", "beginning", etc., the item was checked on the list. The same corpus of words was used for this count as for the two preceding counts. Concepts were counted only once. The total score was a count of the number of concepts used.

The inter-coder reliability for all of the spontaneous speech measures was above .90.

Results

Means and standard deviations for the various groups for each measure appear in Table 1. A social class X race X sex analysis of variance was conducted for each of the eight test measures and three spontaneous speech measures of language.

The first hypothesis, that differences would exist between social class and racial groups on the tests (unfamiliar) but not on the spontaneous speech measures (natural) was only partially supported. Only one significant main effect was obtained. It was due to race on the auditory vocal automatic subtest. The results indicated that Black children of both social classes made errors on the test of the type that would be expected of black dialect speakers.

There was a significant ($p < .05$) social class interaction on Vocabulary. The white MC and black LC children had lowest scores.

On most of the tests, the groups were remarkably similar. This was also true of the spontaneous speech measures. Therefore, lacking the first part of the hypothesis, that there would be social class and race differences in test measures, the second part of the hypothesis, that there would be no spontaneous speech differences, becomes less important.

The hypothesis that there would be more test-spontaneous

speech correlations when subject-examiner similarity is greatest received partial support. There were 7 significant correlations (of 24 possible) for white children and only 1 for black children. As may be seen in Table 2, there were no ethnicity or sex differences in number of significant correlations.

Discussion

The only two significant findings of the study appear to be, for the first, quite expected, and for the second, unexplainable. The Auditory Vocal Automatic test was included to assess understanding of grammatical forms, but it was known to be susceptible to the nonstandard form of English known as Black dialect. If the Black Ss in this sample spoke Black dialect, and an examination of the transcripts showed that they did, they would be expected to receive a "poor" score on this test. It was designed to assess standard, not nonstandard, English. The social class by race interaction for Vocabulary defies explanation. There is nothing in the literature to suggest it is anything but a random finding.

That the test results were so similar for the various groups is surprising. It is possible that the groups sampled do not differ on these tests, but this seems unlikely in view of the many studies that have found 10 to 15 IQ point differences between social classes and races on the same kinds of tests (Hess 1970, Kaufman 1972). What seems more likely is that controlling Performance IQ

in some way wiped out differences between groups on the Verbal scales. The evidence that this is the case, however, is not compelling. For example, the correlation between Performanc and Verbal IQs was rather low in this study. It was only .44 as compared with the.64 reported for the standardization sample (Wechsler 1967). The ITPA subscales were not significantly correlated with Performance IQ.

The method of matching groups did have the effect of reducing the range of Performance IQs for the groups. The SDs for the Performance IQ was 9.13 and for the Verbal IQ it was 10.54. Both of these SDs are substantially lower than the SD of 15 for the normative sample. The actual range of test scores was 81-126 for Performance and 82-119 for Verbal. In attempting to match groups for Performance IQ we found it difficult to locate LC children with IQs above 100 and MC children below 100. The outcome of much searching was a sample of children with IQs in the middle range.

The relationship between test and spontaneous speech measures of language remains unclear. In this study, the T-unit was clearly the most psychologically relevant of the three measures used. For the total sample, it was significantly correlated with six of the total scales including all three of the ITPA scales. The type-token ratio correlated with only two scales and the concept Usuage measure showed no significant correlations.

The results point to the conclusion that when Performance IQ is controlled, social class, racial, and sex differences in language do not exist except for measures of dialect. The many studies of language that have shown social class and racial differences typically have not attempted to control nonverbal intelligence. While these studies have placed emphasis on language differences, they have perhaps actually dealt with differences in cognitive functioning of a much broader sort (Hess 1970).

The data collected for this study are being examined further with refined measures of syntactic complexity and concept use to explore the relationship between tested and spontaneous language.

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TABLE 1

MEANS AND STANDARD DEVIATIONS OF ALL VARIABLES

TOTAL SAMPLE, RACE, SOCIAL CLASS AND SEX

	Groups						
		Race		Social Class		Sex	
	Total	Black	White	Middle	Lower	Girl	Boy
N	40	20	20	20	20	20	20
Control							
Age	54.47	54.20	54.75	54.70	54.25	54.60	54.35
	3.00	2.73	3.29	2.27	3.63	3.00	3.07
Performance IQ	103.00	103.05	102.95	102.50	103.50	102.4	103.60
	9.13	8.23	9.74	10.96	7.10	10.73	7.42
Language Tests							
Verbal IQ	99.30	98.35	100.25	101.35	97.25	99.15	99.45
	10.54	10.44	10.82	10.72	10.21	9.28	11.91
Information	10.43	9.75	11.10	11.00	9.85	10.80	10.05
	2.99	2.24	3.52	3.31	2.60	3.32	2.67
Vocabulary	9.70	9.80	9.60	9.70	9.70	9.30	10.10
	2.11	2.04	2.23	2.25	2.03	1.69	2.45
Comprehension	10.20	9.80	10.60	10.50	9.90	9.80	10.60
	2.07	2.04	2.06	2.31	1.80	2.26	1.82
Sentences	9.63	9.80	9.45	10.25	9.00	10.15	9.10
	2.75	2.95	2.61	2.61	2.81	2.20	3.18

TABLE 1 CONTINUED

	Groups						
		Race		Social Class		Sex	
	Total	Black	White	Middle	Lower	Girl	Boy
Auditory Vocal Automatic	7.33	5.75	8.70	8.35	6.30	6.75	7.90
	3.60	2.63	3.78	3.76	3.18	3.74	3.43
Auditory Vocal Association	10.53	10.20	10.85	11.10	9.95	10.35	10.70
	3.58	2.89	4.21	3.57	3.59	3.65	3.60
Vocal Encoding	10.18	10.55	9.80	9.50	10.85	10.85	9.50
	3.79	3.69	3.94	3.78	3.77	2.80	4.55
Spontaneous Speech							
Type-Token Ratio	.379	.379	.378	.372	.385	.382	.375
	.049	.045	.053	.054	.043	.042	.055
T-Unit	5.07	5.02	5.13	5.12	5.03	5.10	5.05
	.71	.53	.86	.62	.80	.62	.80
Concept Use	13.20	12.80	13.60	13.65	12.75	13.60	12.80
	3.10	3.30	2.91	2.39	3.68	2.98	3.24

Standard deviations are reported below means for each variable.

TABLE 2

SIGNIFICANT CORRELATIONS BETWEEN TESTS AND SPONTANEOUS MEASURES FOR TOTAL, RACE, SOCIAL CLASS AND SEX

	Groups						
		Race		Social Class		Sex	
	Total	Black	White	Middle	Lower	Girls	Boys
Test Variables	11 12 13	11 12 13	11 12 13	11 12 13	11 12 13	11 12 13	11 12 13
Verbal IQ	39		52				
Information	31				47		45
Vocabulary	33 36		49 57		45		
Comprehension	42		51	52		44	47
Sentences							
Auditory Vocal Automatic	50	52	52	60	60		60
Auditory Vocal Association	58		49 70	55	62	51	64
Vocal Encoding	37						

11. Type-Token Ratio 12. T-units 13. Concept use